THAT WHICH IS CLAIMED:

1. An apparatus adapted to interact with a cylindrical mold for a gyratory compactor, the mold being adapted to contain a sample therein, so as to determine a gyration angle of the mold, said apparatus comprising:

a rigid disk-shaped plate defining an axis and a periphery, the plate being adapted to be disposed within a wall of the cylindrical mold in communication with the sample; and

at least one inductive sensing device operably engaged with the plate so as to be spaced apart from and cooperable with the wall when the plate is disposed within the mold, the at least one inductive sensing device being configured to produce a signal corresponding to the angle of the wall with respect to the axis of the plate, the signal thereby being indicative of the gyration angle of the mold.

2. An apparatus according to Claim 1 wherein the plate is comprised of a nonmagnetic material.

3. An apparatus according to Claim 1 wherein the at least one inductive sensing device is operably engaged with the plate about the periphery thereof such that the at least one inductive sensing device is disposed adjacent to and spaced apart from the wall of the mold when the plate is disposed within the mold.

4. An apparatus according to Claim 1 wherein the at least one inductive sensing device is comprised of a pair of spaced-apart inductive transducers configured such that an inductance sensed by each transducer varies as a function of the angle of the wall with respect to the axis of the plate.

5. An apparatus according to Claim 4 wherein the inductive transducers are housed by a nonmagnetic housing.

6. An apparatus according to Claim 4 wherein the inductive transducers are operably engaged with the plate such that the inductance sensed by each of the transducers is equal when the wall is parallel to the axis of the plate.

7. An apparatus according to Claim 1 further comprising a receiving unit configured to receive the signal from the at least one inductive sensing device and to at least one of provide an indicia of the gyration angle of the mold and store the signal in a computer-readable manner.

8. An apparatus according to Claim 1 further comprising a receiving device remotely disposed with respect to the plate, wherein the signal is directed from the at least one inductive sensing device to the receiving unit by a transmission device selected from the group consisting of a cable and a wireless data transmission system.

9. An apparatus adapted to interact with a gyratory compactor so as to determine a gyration angle, said apparatus comprising:

an open-ended cylindrical mold having a wall defining an inner diameter, the mold being adapted to contain a sample therein for compaction by the gyratory compactor;

a rigid disk-shaped plate defining an axis and a periphery and having a diameter corresponding substantially to the inner diameter of the mold, the plate being adapted to be disposed within the mold in communication with the sample; and

at least one inductive sensing device operably engaged with the plate so as to be spaced apart from and cooperable with the wall when the plate is disposed within the mold, the at least one inductive sensing device being configured to produce a signal corresponding to the angle of the wall with respect to the axis of the plate, the signal thereby being indicative of the gyration angle of the mold.

10. An apparatus according to Claim 9 wherein the plate is comprised of a nonmagnetic material.

11. An apparatus according to Claim 9 wherein the at least one inductive sensing device is operably engaged with the plate about the periphery thereof such that the at least one inductive sensing device is disposed adjacent to and spaced apart from the wall of the mold when the plate is disposed within the mold.

12. An apparatus according to Claim 9 wherein the at least one inductive sensing device is comprised of a pair of inductive transducers configured such that an inductance sensed by each transducer varies as a function of the angle of the wall with respect to the axis of the plate.

13. An apparatus according to Claim 12 wherein the inductive transducers are housed by a nonmagnetic housing.

14. An apparatus according to Claim 12 wherein the inductive transducers are operably engaged with the plate such that the inductance sensed by each of the transducers is equal when the wall is parallel to the axis of the plate.

15. An apparatus according to Claim 9 further comprising a receiving unit configured to receive the signal from the at least one inductive sensing device and to at least one of provide an indicia of the gyration angle of the mold and store the signal in a computer-readable manner.

16. An apparatus according to Claim 9 further comprising a receiving device remotely disposed with respect to the plate, wherein the signal is directed from the at least one inductive sensing device to the receiving unit by a transmission device selected from the group consisting of a cable and a wireless data transmission system.

17. A system for determining a gyration angle in a gyratory compactor, said system comprising:

a gyratory compactor apparatus;

an open-ended cylindrical mold having a wall defining an inner diameter, the mold being configured to be operably engageable with the gyratory compactor apparatus and adapted to contain a sample therein for compaction by the gyratory compactor;

a rigid disk-shaped plate defining an axis and a periphery and having a diameter corresponding substantially to the inner diameter of the mold, the plate being adapted to be disposed within the mold in communication with the sample; and

at least one inductive sensing device operably engaged with the plate so as to be spaced apart from and cooperable with the wall when the plate is disposed within the mold, the at least one inductive sensing device being configured to produce a signal corresponding to the angle of the wall with respect to the axis of the plate, the signal thereby being indicative of the gyration angle of the mold.

18. A system according to Claim 17 wherein the plate is comprised of a nonmagnetic material.

19. A system according to Claim 17 wherein the at least one inductive sensing device is operably engaged with the plate about the periphery thereof such that the at least one inductive sensing device is disposed adjacent to and spaced apart from the wall of the mold when the plate is disposed within the mold.

20. A system according to Claim 17 wherein the at least one inductive sensing device is comprised of a pair of inductive transducers configured such that an inductance sensed by each transducer varies as a function of the angle of the wall with respect to the axis of the plate.

21. A system according to Claim 20 wherein the inductive transducers are housed by a nonmagnetic housing.

22. A system according to Claim 20 wherein the inductive transducers are operably engaged with the plate such that the magnetic flux through each of the transducers is equal when the wall is parallel to the axis of the plate.

23. A system according to Claim 17 further comprising a receiving unit configured to receive the signal from the at least one inductive sensing device and to at least one of provide an indicia of the gyration angle of the mold and store the signal in a computer-readable manner.

24. A system according to Claim 17 further comprising a receiving unit remotely disposed with respect to the plate, wherein the signal is directed from the at least one inductive sensing device to the receiving unit by a transmission device selected from the group consisting of a cable and a wireless data transmission system.

25. A method of determining a gyration angle of an open-ended cylindrical mold for a gyratory compactor, the mold being adapted to contain a sample therein, said method comprising:

inserting at least one inductive sensing device into an open end of the mold, the mold having a wall defining an inner diameter, the at least one inductive sensing device being operably engaged with a rigid disk-shaped plate defining an axis and having a diameter corresponding substantially to the inner diameter of the mold, the at least one inductive sensing device being disposed about a periphery of the plate so as to be spaced apart from and cooperable with the wall when the plate is disposed within the mold; and

receiving a signal from the at least one inductive sensing device, the signal corresponding to the angle of the wall with respect to the axis of the plate as dynamically determined by the at least one inductive sensing device as

the mold is being gyrated, the signal thereby being indicative of the gyration angle of the mold.

26. A method according to Claim 25 wherein inserting at least one inductive sensing device further comprises inserting at least one inductive sensing device into an open end of the mold such that the at least one inductive sensing device is disposed adjacent to and spaced apart from the wall of the mold.

27. A method according to Claim 25 wherein inserting at least one inductive sensing device further comprises inserting at least one inductive sensing device, comprised of a pair of spaced-apart inductive transducers, into an open end of the mold, the transducers being configured such that an inductance sensed by each transducer varies as a function of the angle of the wall with respect to the axis of the plate and such that the inductance sensed by each of the transducers is equal when the wall is parallel to the axis of the plate.

28. A method according to Claim 25 wherein receiving a signal from the at least one inductive sensing device further comprises receiving a signal from the at least one inductive sensing device at a receiving unit configured to at least one of provide an indicia of the gyration angle of the mold and store the signal in a computer-readable manner.

29. A method according to Claim 25 wherein receiving a signal from the at least one inductive sensing device further comprises receiving a signal from the at least one inductive sensing device at a receiving unit remotely disposed with respect to the plate, the signal being directed from the at least one inductive sensing device to the receiving unit by a transmission device selected from the group consisting of a cable and a wireless data transmission system.